Chapter 5:

How Far? How Tall? How Steep?

Section 5.1 – Ratios Based on Right Triangles

Curriculum Outcomes	Related Activities	Page in Text
• use inductive and deductive reasoning when observing patterns, developing properties, and making conjectures	• use nested triangles to see that the effect of a dilatation from a vertex of a triangle is to create similar triangles • measure side lengths in similar triangles to observe constant ratios and generalize from the patterns	213 213
• determine whether differenced in measurement, while conducting experiments are significant or crucial	• compare ratios based on measurements which might be close to equal, ut not exactly equal, to decide if equality can be assumed	214
• determine and apply formulas for perimeter, area, surface area, and volume	• examine the effect of scale factors on triangle perimeter and area	215
• solve problems involving similar triangles and right triangles	• find missing lengths in triangles by setting up proportions with similar triangles	215
• solve problems involving measurement using bearings and vectors • apply the properties of similar triangles	• explore the equivalence of vector, compass direction, and bearing descriptions of movement	216

5.1 – Ratios Based on Right Triangles

Congruent Triangles

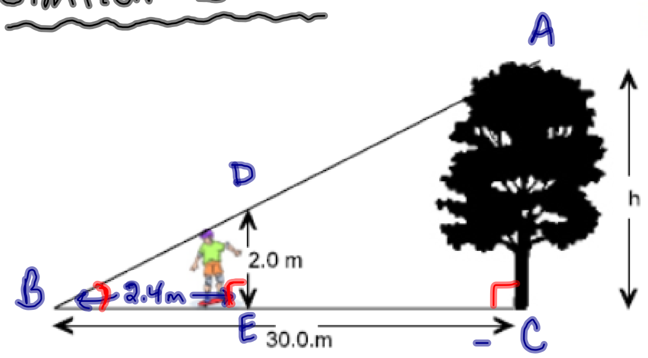
- Two triangles are congruent if all the angles and all the side lengths of one triangle match all the angles and all the corresponding side lengths of the other. It looks as if the first triangle had been moved to a new spot.

5.1 – Ratios Based on Right Triangles

Similar Triangles

- Two triangles are similar if one triangle is an enlargement or reduction of the other. The triangles have exactly the same angles, but each of the side lengths of one triangle is the same multiple (could be a decimal number such as 1.5) of the corresponding side length of the other.

Similar Δ Ex:



All angles in a triangle add up to 180°.

Ratios:

$$\frac{\cancel{AB}}{\cancel{DB}} = \frac{CB}{EB} = \frac{AC}{DE}$$

1. Re-draw and label the diagram above, using similar triangles.

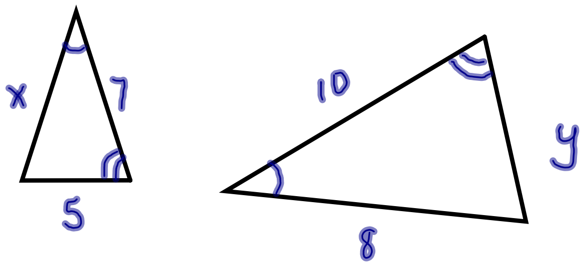
2. Determine the height of the tree.

$$2 \cdot \frac{30.0}{2.4} = \frac{h}{\cancel{2.0}} \cdot \cancel{2}$$

$$\frac{60}{2.4} = h$$

$$h = 25m$$

Ex. #2:



$$\frac{10}{7} = \frac{8}{x} = \frac{y}{5}$$

$$\cancel{5} \cdot \frac{y}{\cancel{5}} = \frac{10}{7} \cdot 5$$

$$y = \frac{50}{7}$$

$$y = 7.1$$

$$\cancel{x} \cdot \frac{8}{\cancel{x}} = \frac{10}{7} \cdot x$$

$$7 \cdot 8 = \frac{10x}{\cancel{7}} \cdot \cancel{7}$$

$$\frac{56}{10} = \frac{\cancel{10}x}{\cancel{10}}$$

$$x = 5.6$$

$$\frac{8}{x} = \frac{10}{7}$$

$$56 = 10x$$

<u>Classwork/Homework</u>

- FMT (yellow text)
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